

36. First, no recovery of unattributable costs should be allowed unless the ILEC shows that such costs must, in fact, be incurred (on a forward-looking, efficiency-maximizing basis) in common by or shared between the requested network element(s) and other network elements. Such a showing can be made by estimating the aggregate TSLRIC of all the outputs to which the unattributable costs are shared. In no circumstances should the Commission allow ILECs to satisfy this burden with data based on accounting allocations of embedded costs. Efficient costs are never measured by an ILEC's actual historical "overhead" expenditures.

37. Second, the difference between the TSLRIC of an aggregate of outputs, and the sum of the TSLRICs of each subset of those outputs, should be assigned to individual network elements on an efficient and competitively neutral basis. In particular, if the magnitude of the additional revenue to be recovered is too small to be of allocative or competitive significance, then a simple method of recovering the revenue through small markups applied to each network element could be justified by the litigation and other transaction costs avoided. Where the additional revenue is significantly large, the method of revenue recovery should be consistent with allocative and competitive efficiency.⁷

38. Third, the sum of the incremental costs attributed to a requested network element (or elements), and the common or shared costs allocated to those elements, should never be allowed to exceed the stand-alone costs ("SAC") or TSLRIC of supplying those elements in the

⁶ (...continued)

respect to the volume of business, and attributable to particular network elements. Regardless of the arbitrary accounting label, costs of this kind are properly included in the TSLRIC of the relevant network element.

⁷ In particular, an ILEC should not be allowed to charge other carriers a price for a network element that is higher than the imputed price charged by the ILEC to itself in the context of a competing offering.

aggregate. As explained above, SAC is the economic cost of supplying an output in isolation from other outputs. Prices in perfectly contestable markets can never exceed SAC.

III. THE HATFIELD MODEL APPLIES PROPER STANDARDS FOR ESTIMATING TSLRIC.

39. We have reviewed the costing model constructed for AT&T and MCI by Hatfield Associates, Inc., a telecommunications consulting firm. The object of the current Hatfield model is to estimate the total costs of building and operating a network, using efficient, forward-looking technology, to supply all "basic" narrowband services (essentially all local and intraLATA toll service, including carrier access) currently supplied in the United States. We conclude that the Hatfield Model follows reasonably closely the TSLRIC principles discussed in Section II. Where limitations on the availability of data have forced the designers of the model to use approximations that deviate from the theoretical ideal, the shortcuts adopted tend to overestimate, not underestimate, true TSLRIC. Further, the model is extremely flexible: whenever more specific or accurate values are available, they can readily be substituted for the values used currently.

A. The Hatfield model uses *forward-looking* costs, and estimates the costs of an *efficient, cost-minimizing* supplier.

40. The Hatfield model provides reasonable estimates of forward-looking, efficient costs. These first two of the TSLRIC tenets identified in Section II above -- forward-looking and efficiency-maximizing -- are, in our view, the critical elements of any legitimate TSLRIC study.

41. Our examination of the Hatfield Model investment calculations indicates that they entail a state-of-the-art data modeling approach in the construction of local loop, switching and transport, signalling, and operator services. In its assumptions, the model respects the requirement that the network (and the associated functions) be configured in a manner that

minimizes the costs of providing narrowband, local exchange services, including access and interconnection. Hatfield's sizing of the network and selection of its architecture reflect all of the end-user and carrier-to-carrier demands that are put on the local network. We also understand that the model uses realistic fill factors.

42. The modular nature of the model permits TSLRIC estimates that satisfy the assumption that CLECs may provide some of the network functions using their own facilities. In other words, the assumed demands need not be the same for each network element but, instead, can be adjusted to reflect the effects of facilities-based entry.

43. The most sophisticated modeling of investment cost is that for costs associated with the local loop. This is appropriate, for we understand that investment in the local loop accounts for nearly half of the aggregate investment outlays captured by the model. The model also reflects the most efficient switching technology, and uses actual discounted prices rather than list prices for switching equipment.

44. Where the model falls short of the theoretical ideal, it tends to err in the direction of overestimation, not underestimation, of actual TSLRIC. First, since adequate data are not yet available to model a local exchange that is fully optimized in the locations of wire centers and tandem switches, the model assumes that the existing locations are optimal. If and when the modeling of optimal locations becomes feasible, those locations can readily be substituted as inputs for existing switch locations. Such an adjustment should reduce, not increase, the TSLRIC estimates produced by the current version of the model.

45. Further, the population is assumed to be uniformly distributed in the model. In actuality, ILECs are free to deploy their networks to take advantage of population variations,

siting wire centers in or near population concentrations where possible. Here again, we understand that the model errs on the side of conservatism.

46. The model estimates forward-looking non-investment expenses by scaling down certain operating expense data from existing ILECs by the same ratio of efficient, forward-looking investment costs to historic ILEC investment costs. This approach is intuitively plausible insofar as competition in equipment supply markets encourages advances that lower both initial investment and operating expenses.

B. The Hatfield model estimates only the *additional* costs of providing the particular network elements except where data limitations result in the inclusion of costs shared between two or more network elements.

47. Our review of the model confirms that its estimates are limited, where possible, to the economic costs of particular network elements. First, the model uses an engineering rather than an accounting approach to cost estimation. Consequently, it does not need the arbitrary cost allocations that are inevitably associated with cost studies based on accounting cost data.

48. Second, network elements whose costs are estimated by the model are defined at a level of sufficient aggregation to include most costs that would otherwise be shared between individual network services. As a result, the share of total costs not captured in the pertinent TSLRICs is likely to be small. This minimizes the need for potentially arbitrary judgments about the proper treatment of various cost components.

49. Finally, where the model deviates from efficient incremental costing, the deviations are likely to overestimate, not underestimate, the resulting cost values. For example, the costs of local or tandem switching are estimated on a stand-alone basis, without regard for the economies of scope associated with production of switching along with signalling.

C. The Hatfield model takes into account the entire demand of *all* uses and users of a network element or group of network elements.

50. The Hatfield model also deals with the entire demand for each network element, and the Hatfield unit cost estimates assume that switches, trunks, and other assets are sized to produce at least the levels of current output. The resulting TSLRIC values should therefore reflect most of the potential economies of scale permitted by current demand levels.

D. The Hatfield model recognizes significant geographic cost differences.

51. Finally, the Hatfield model is highly sensitive to variations in geography and population density. These differences can have potentially significant effects on estimated costs. Ignoring these divergences from average values can create incentives for inefficient entry, opportunities for anticompetitive cross-subsidies, and obstacles to full cost recovery for the ILECs. Our review of the Hatfield model indicates that the estimated TSLRICs are as free as possible from these distortions.

IV. ECONOMICALLY DEFENSIBLE PRINCIPLES OF RATE DESIGN ARE IMPORTANT.

52. We understand that the Commission has not limited its inquiry to appropriate principles for determining overall rate levels, but also proposes to adopt certain rate structuring principles. This is entirely proper and commendable, for even if rates are set at the right overall levels to recover true economic costs (as measured by appropriate TSLRIC modeling), inappropriate rate structures can impair competition, create inefficiencies, and harm consumers.

53. Most fundamentally, efficiency-maximizing network element rates should, to the extent reasonably possible, recover costs in a manner that reflects the way those costs are caused to be incurred. We understand, for example, that most or all of the costs attributable to a number of the ILEC network elements proposed to be unbundled are driven by capacity, not

usage. The costs of such network elements, which when purchased by a CLEC are essentially dedicated to that CLEC's use and not shared by others, can be attributed directly to that CLEC. Capacity charges are efficiency-maximizing in those circumstances.

54. Usage-sensitive charges, by contrast, could lead to inefficient outcomes at both ends of the usage spectrum when costs vary with capacity, not usage. First, because usage sensitive network element charges would exceed the true economic cost of serving high volume end users, such charges would encourage inefficient CLEC bypass of the ILEC network to serve those customers. At the same time, usage sensitive charges that did not reflect the true economic cost of serving low volume end users would encourage inefficient levels of CLEC purchases of the network elements in question.

55. Usage charges may be appropriate, however, when capacity costs cannot be readily attributed to particular CLECs or end users. An example is common transport. The conceptually correct cost driver is capacity, with its cost recovery apportioned among individual users or uses in manners sensitive to their share of total demand during peak periods. We understand that accurately determining the relative responsibility for total demand during these periods may be currently infeasible, however. Here, usage charges may make economic sense.

V. PRIVATE NEGOTIATIONS ARE UNLIKELY TO ACHIEVE ECONOMICALLY DEFENSIBLE RATE LEVELS UNLESS THE COMMISSION PRESCRIBES THE BASIC PRINCIPLES FOR ECONOMIC COSTS.

56. The Commission has properly proposed to prescribe standards for determining TSLRIC, rather than leaving the pricing of network elements to unconstrained bargaining between ILECs and other carriers. Without a firm regulatory constraint, the ILECs' market power is likely to yield bargaining outcomes that are one-sided, anticompetitive, and inefficient.

57. A regulatory model with predictable litigation outcomes will increase the likelihood of settlement. If an ILEC and an entrant seeking to purchase network elements both know that the alternative to voluntary agreement is arbitration or adjudication based on TSLRIC pricing principles, both parties will be motivated to negotiate in good faith to reach an individualized agreement. Arbitration or adjudication by a third-party, no matter how wise and well-informed, is inevitably based on incomplete information and thus is almost certain to be less accurately shaped by commercial reality than is fully optimal. Determination of prices through private agreement can make both sides better off, for it can adapt itself effectively to the commercial details on the basis of more complete information. The potential gains from private negotiations can be realized, however, only if the regulatory backstop excludes the possibility of one-sided monopolistic outcomes.

58. Analogous experience in the railroad industry underscores these propositions. Major amendments to the Interstate Commerce Act in 1976 and 1980 left the standards for railroad rate regulation in flux for a number of years. By 1981, the Interstate Commerce Commission faced a backlog of several hundred unresolved rate disputes between railroads and shippers. In late 1983, the ICC proposed to limit rates with constraints based on forward-looking economic costs. The proposed standards were adopted in final form in 1985, were applied in a number of individual rate adjudications in the mid- and late 1980s, and were endorsed by the Railroad Accounting Principles Board in 1987. The new rate standards, while not costless to litigate, yielded generally predictable results. We understand that since the late 1980s, the overwhelming majority of rates have been established through voluntary contractual agreements rather than litigation.

VI. SUBSIDIES FOR UNIVERSAL SERVICE SHOULD BE KEPT TO A MINIMUM, AND IMPOSED IN A COMPETITIVELY NEUTRAL MANNER.

59. Whatever their intended purpose, deliberate deviations between network element prices and economic costs should be kept to a minimum. Deviations of this kind inevitably distort the allocation of resources, create incentives for inefficient facilities-based entry into areas with excessive carrier prices, and create artificial barriers to efficient facilities-based entry in areas where rates are too low.

60. A deliberate wedge between prices and TSLRIC is most likely to result from a decision to subsidize universal service or other regulatory goals. It is vital for the public interest that such deviations from competitive pricing be as small as possible, and that both funding and distribution be carried out through mechanisms that are *competitively neutral* -- i.e., that do not distort competition between the ILEC and its potential rivals.

61. To be competitively neutral, a regulatory wedge between prices and TSLRIC must never favor new entrants over incumbents, or *vice versa*. It must not benefit the proprietor of a bottleneck service over a rival that purchases the service. It must not favor firms that use one type of technology over another. The reason is obvious: any such departures from competitive neutrality tend to channel the business to inefficient suppliers. This inefficient allocation of business will raise costs, repress innovation and investments and -- as usual when competition is subverted -- needlessly burden consumers.

62. For example, competitive neutrality would plainly be violated if regulation permitted (or required) the ILEC to price some end-user service, call it "service L," below its TSLRIC, and to make up the financial difference through markups above TSLRIC on prices for carrier-to-carrier services. The below-cost pricing of service L by the ILEC, funded by overcharges for

services supplied to competing carriers, would prevent CLECs from competing successfully for the end-user service *even if more efficient than the ILEC*.

63. The same regulatory goal can be achieved in a competitively neutral fashion by (1) providing an equal subsidy to *any* firm that supplies a unit of service L; and (2) collecting funds for the subsidy from carriers or end users, *irrespective of* the identity of the supplier providing the service or serving the end user. With such a competitively neutral mechanism, the end users of service L would still face the (intended) below-cost price, and the end users of other services would still be the source of funding for the subsidy. Significantly, however, the competitively neutral subsidy would enable the most efficient carrier to succeed in serving the end-users of service L and the other services that help to support service L. And since each rival, including the ILEC, would receive the same unit subsidy by providing service L, each could price down to its own unit cost, less the subsidy. Just as in a subsidy-free environment, the low-cost supplier could win the business.

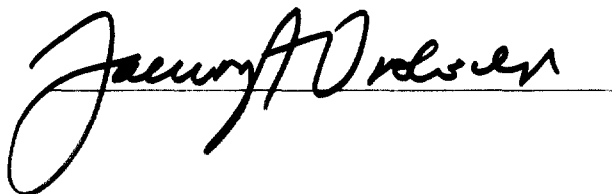
DECLARATION

I, William J. Baumol, declare under penalty of perjury that the foregoing is true and correct. Executed on May 15 1996.



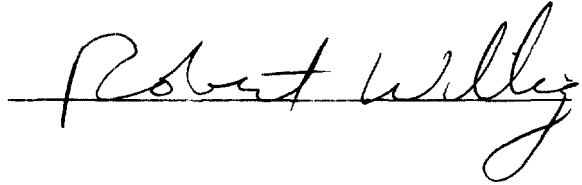
DECLARATION

I, Janusz A. Ordovery, declare under penalty of perjury that the foregoing is true and correct. Executed on May 14, 1996

A handwritten signature in black ink, reading "Janusz A. Ordovery", is written over a horizontal line.

DECLARATION

I, Robert D. Willig, declare under penalty of perjury that the foregoing is true and correct. Executed on May 15, 1996.

A handwritten signature in cursive script, reading "Robert Willig", is written over a horizontal line.

WILLIAM J. BAUMOL

Curriculum Vitae

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BSS College of the City of New York, 1942

Ph.D University of London, 1949

1942–1943 and 1946: Junior Economist, U.S. Dept. of Agriculture

1947–49: Assistant Lecturer, London School of Economics

1949–92: Professor of Economics, Princeton University

1992–current: Senior Research Economist and Professor of Economics Emeritus,
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1971–current: Professor of Economics and Director, C.V. Starr Center for Applied
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1953 Fellow, Econometric Society

1957–58 Guggenheim Fellow

1965 Honorary LL.D, Rider College (Trustee Emeritus)

1965–66 Ford Faculty Fellowship

1968 Joseph Douglas Green '95 Professor of Economics, Princeton University

1970 Honorary Fellow, London School of Economics

1971 Member, American Academy of Arts and Sciences

1971 Honorary Doctorate, Stockholm School of Economics

1973 Honorary Doctor of Humane Letters, Knox College

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1975 John R. Commons Award, Omicron Delta Epsilon

1975 Townsend Harris Medal, Alumni Association of the City College of New York

1977 Member, American Philosophical Society

1982 Distinguished Fellow, American Economic Association

1984 Distinguished Member, Economic Association of Puerto Rico

1986 Winner, Assoc. of American Publishers Award for Best Book in Business,
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1987 Recipient, Frank E. Seidman Distinguished Award in Political Economy

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1989 Winner, Assoc. of Am. Publishers Annual Awards for Excellence in Publishing,
Honorable Mention in Social Sciences, *Productivity and American Leadership:
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1992 Recipient, First Senior Scholar in the Arts and Sciences Award, New York
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1995 Honorary Degree, University of Limburg, Maastricht, Holland

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PROFESSIONAL ACTIVITIES:

Member, Advisory Board, Insurance Information Institute Press

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Member, Editorial Board, Journal of Cultural Economics

Principal Investigator, Students at Risk Comm., Inst. for Education
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Member, Advisory Committee, World Resources Institute (founding member)

Member, Editorial Advisory Board, *Supreme Court Economic Review*

Member, Board of Trustees, National Council on Economic Education

Member, Advisory Committee, Center for Entrepreneurial Studies, Graduate

School of Business Administration, New York University
 Member, Board of Directors, Theater Development Fund
 Member, National Science Foundation review panel for Science and Technology Research Centers
 Member, Advisory Board, Fishman-Davidson Center for the Study of the Service Sector, Wharton School, University of Pennsylvania
 Correspondent, Committee on Human Rights, National Academy of Sciences
 Member, Committee on the National Institute for the Environment, National Academy of Sciences
 Member, Board of Consultants, *Economia, Revista Quadrimestral* (Portugal)
 Past President, American Economic Association (1981), Association of Environmental and Resource Economists (1979), Eastern Economic Association (1978-79), Atlantic Economic Society (1985)
 Past Chairman and Member, Economic Policy Council, State of New Jersey (1967-75)
 Past Vice President, American Association of University Professors
 Various times on Boards of Editors for *American Economic Review*, *Kyklos*, *Journal of Economic Literature*, *Management Science*, *Economic Notes* (Italy), *Journal of Economic Education*, *Impresa e Concorrenza* (Italy), *THESIS: Theory and History of Economic and Social Institutions and Structures* (USSR), *Feminist Economics*
 Frequent consultant to government and industry, in U.S. and many other countries.

BOOKS PUBLISHED:

Economic Dynamics (with R. Turvey), 1951, 1959, 1970
Welfare Economics and the Theory of the State, 1952, 1965.
Economic Processes and Policies (with L.V. Chandler), 1954
Business Behavior, Value and Growth, 1959, 1966
Economic Theory and Operations Analysis, 1961, 1965, 1972, 1976
The Stock Market and Economic Efficiency, 1965
Performing Arts: The Economic Dilemma (with W.G. Bowen), 1966
Precursors in Mathematical Economics: An Anthology (with S.M. Goldfeld), 1968
Portfolio Theory: The Selection of Asset Combinations, 1970
Economics of Academic Libraries (with M. Marcus), 1973
The Theory of Environmental Policy (with W.E. Oates), 1975, 1988
Selected Economic Writings of William J. Baumol, E.E. Bailey, ed., 1976
Economics, Environmental Policy, and the Quality of Life (with W.E. Oates and S.A. Batey Blackman), 1979
Economics: Principles and Policy (with A.S. Blinder), 1979, 1982, 1985, 1987, 1991, 1994.
Public and Private Enterprise in a Mixed Economy (editor), 1980.
Contestable Markets and the Theory of Industry Structure (with R.D. Willig and J.C. Panzar), 1982, 1987
Inflation and the Performing Arts (editor with H. Baumol), 1984
Productivity Growth and U.S. Competitiveness (editor with K. McLennan), 1985
Superfairness: Applications and Theory, 1986
Microtheory: Applications and Origins, 1986
The Information Economy and the Implications of Unbalanced Growth (with L. Osberg and E.N. Wolff), 1989
Productivity and American Leadership: The Long View (with S.A. Batey Blackman and E.N. Wolff), 1989
The Economics of Mutual Fund Markets: Competition vs. Regulation (with S.M. Goldfeld, L.A. Gordon and M.F. Koehn), 1990.

Perfect Markets and Easy Virtue: Business Ethics and the Invisible Hand (with S.A. Batey Blackman), 1991.
Entrepreneurship, Management and the Structure of Payoffs, 1993.
Toward Competition in Local Telephony (with Gregory Sidak), 1994.
Convergence of Productivity: Cross-National Studies and Historical Evidence (ed. with R.R. Nelson and E.N. Wolff), 1994.
Transmission Pricing and Stranded Costs in the Electric Power Industry (with J. G. Sidak), 1995.
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WILLIAM J. BAUMOL

1996 PUBLICATIONS

CHAPTERS IN BOOKS:

William J. Baumol, "Discussion," in Gianluca Fiorentini and Sam Peltzman, eds., *The Economics of Organised Crime*, Cambridge: Centre for Economic Policy Research, Cambridge University Press, 1996, pp. 82–84.

OTHER ARTICLES:

William J. Baumol, "Comment: Private Litigation for the Purpose of Constraining Competition," editorial in *In Competition* (U.K.), Issue 3, April 15, 1996.

WILLIAM J. BAUMOL

1995 PUBLICATIONS

BOOKS:

William J. Baumol (with J. Gregory Sidak), *Transmission Pricing and Stranded Costs in the Electric Power Industry*, Washington, D.C.: American Enterprise Institute, 1995, 180 pages.

William J. Baumol (editor with William E. Becker), *Assessing Educational Practices: The Contribution of Economics*, Cambridge, Mass.: MIT Press, 1995, 285 pages.

CHAPTERS IN BOOKS:

William J. Baumol (with J. Gregory Sidak), "Pricing of Services Provided to Competitors by the Regulated Firm," in Paul W. MacAvoy, ed., *Deregulation and Privatization in the United States*, Edinburgh, U.K.: David Hume Institute, Edinburgh University Press, 1995, pp. 15–31.

William J. Baumol, Obituary, in Rolf G.H. Henriksson, ed., *Erik Lundberg: Studies in Economic Instability and Change*, Stockholm: SNS Forlag, Kristianstads Boktryckeri AB, 1995.

William J. Baumol, "On My Rejected Articles," in George B. Shepherd, ed., *Rejected: Leading Economists Ponder the Publication Process*, Sun Lakes, Arizona: Thomas Horton & Daughters, 1995, pp. 46–47.

ARTICLES IN REFEREED JOURNALS:

William J. Baumol (with Ralph E. Gomory), "A Linear Ricardo Model with Varying Parameters," *Proceedings of the National Academy of Sciences (U.S.)*, Vol. 92, No. 4, February 14, 1995, pp. 1205–1207.

William J. Baumol, "What's Different About European Economics?," *Kyklos*, Vol. 48, Fasc. 2, 1995, pp. 187–192.

William J. Baumol, "Environmental Industries with Substantial Start-Up Costs as Contributors to Trade Competitiveness," *Annual Review of Energy and the Environment*, Vol. 20, 1995, pp. 71–81.

OTHER ARTICLES:

William J. Baumol, "The Pricing of Inputs Sold to Competitors: Rejoinder and Epilogue," *The Yale Journal on Regulation*, Vol. 12, No. 1, 1995, pp. 177–186.

William J. Baumol (with Sue Anne Batey Blackman), "How to Think About Rising College Costs," *Planning for Higher Education*, Vol. 23, No. 4, Summer 1995, pp. 1–7.

William J. Baumol (with J. Gregory Sidak), "Stranded Cost Recovery: Fair and Reasonable," *Public Utilities Fortnightly*, Vol. 133, No. 10, May 15, 1995, pp. 20–23.

William J. Baumol, contribution to Lewis Burke Frumkes, ed., *The Logophile's Orgy: Favorite Words of Famous People*, New York: Delacorte Press, 1995, p. 8.

REPRINTS:

William J. Baumol (with Edward N. Wolff), "Les Dynamiques de Desequilibre et le Mecanisme de Croissance de la Productivite," *Revue Economique*, Vol. 46, No. 6, November 1995, pp. 1391–1404.

William J. Baumol, "On Location of Industries Among Trading Countries: Scale Economies as Possible Offset to Comparative Advantage," chapter in Melvin L. Greenhut and George Norman, eds., *The Economics of Location*, Brookfield, VT: Edward Elgar Publishing Co., 1995.

William J. Baumol (with nine other economists), "The Role of Cost in the Minimum Pricing of Railroad Services, chapter 10 in Tae Hoon Oum, et al., eds., *Transport Economics: Selected Readings*, Seoul, Korea: Korea Research Foundation for the 21st Century, 1995, pp. 237–251.

William J. Baumol (with David F. Bradford), "Optimal Departures from Marginal Cost Pricing," chapter 11 in Tae Hoon Oum, et al., eds., *Transportation Economics: Selected Readings*, Seoul, Korea: Korea Research Foundation for the 21st Century, 1995, pp. 253–284.

BOOKS:

William J. Baumol (with Alan S. Blinder), *Economics: Principles and Policy*, Sixth Edition, Fort Worth: The Dryden Press, Harcourt Brace & Company, 1994, 999 pages.

William J. Baumol (with J. Gregory Sidak), *Toward Competition in Local Telephony*, Cambridge, Mass.: MIT Press, 1994, 169 pages.

William J. Baumol (editor with Richard R. Nelson and Edward N. Wolff), *Convergence of Productivity: Cross-National Studies and Historical Evidence*, New York: Oxford University Press, 1994.

CHAPTERS IN BOOKS:

William J. Baumol, "Economic Education for a Half-Century of Radical Change," in William B. Walstead, ed., *An International Perspective on Economic Education*, Cambridge, Mass.: Kluwer Academic Publishers, 1994, pp. 19-36.

William J. Baumol (with Hilda Baumol), "On the Economics of Musical Composition in Mozart's Vienna," Chapter 4 in James M. Morris, ed., *On Mozart*, Woodrow Wilson Center Press and Press Syndicate of the University of Cambridge: New York and Cambridge, England, 1994, pp. 72-101.

ARTICLES IN REFEREED JOURNALS:

William J. Baumol (with Edward N. Wolff), "A Key Role for Input-Output Analysis in Policy Design," *Regional Science and Urban Economics*, Vol. 24, No. 1, February 1994, pp. 93-113.

William J. Baumol, "Supply of Proprietary Technology: A Neglected Line of Research on Business," *Journal of Economics of Business*, Vol. 1, No. 1, 1994, pp. 9-10.

OTHER ARTICLES:

William J. Baumol, "Contestable Markets," in Douglas Greenwald, eds., *The McGraw-Hill Encyclopedia of Economics*, 2nd edition, New York: McGraw-Hill, Inc., 1994, pp. 215-218.

William J. Baumol (with Januss A. Ordovery), "On the Perils of Vertical Control by a Partial Owner of a Downstream Enterprise," *Revue D'Economie Industrielle*, No. 69, 3e Trimestre, 1994, pp. 7-20.

William J. Baumol (with Ralph E. Gomory), "International Trade and Scale Economies: A New Analysis," Part 1: "Regions of Trade Equilibria: Zones of Conflict and Zones of Cooperation," pp. 1-57; and Part 2: "Toward a Theory of Individual Policy: Retainable Industries," pp. 1-46, London School of Economics, Centre for Economic Performance Discussion Paper No. 205, November 1994.

REPRINTS:

William J. Baumol, "The Chaos Phenomenon: A Nightmare for Forecasters," reprinted in *Readings in Investments*, Stephen Lofthouse, editor, Chichester: John Wiley & Sons, 1994, pp. 475-483.

William J. Baumol (with contributions by Dietrich Fischer), *Superfairness: Applications and Theory*, Cambridge, Mass.: MIT Press, Second Printing 1994, 266 pages.

William J. Baumol (with Hilda Baumol), "On the Economics of Musical Composition in Mozart's Vienna," reprinted in *Journal of Cultural Economics* 18, 1994, pp. 171–198.

WILLIAM J. BAUMOL

1993 PUBLICATIONS

BOOKS:

William J. Baumol, *Entrepreneurship, Management and the Structure of Payoffs*, Cambridge, Mass.: MIT Press, 311 pages.

William J. Baumol (with Alan S. Blinder), *Microeconomics: Principles and Policy*, 6th edition, Ft. Worth: The Dryden Press, Harcourt Brace Jovanovich, Inc., 594 pages.

CHAPTERS IN BOOKS:

William J. Baumol, "Investment, Population Growth and Stationarity of the Ricardian Type," Chapter 1 in Salvatore Biasco, Alessandro Roncaglia, and Michele Salvati, eds., *Market Institutions in Economic Development: Essays in Honour of Paulo Sylos Labini*, New York: St. Martin's Press, 1993, pp. 1–9.

William J. Baumol, "Keynes on Malthus on 'Say's Law'," in Haim Barkei, Stanley Fischer and Nissan Liviatan, eds., *Monetary Theory and Thought*, London: Macmillan, pp. 87–103.

William J. Baumol (with Sue Anne Batey Blackman), "Natural Resources," in David R. Henderson, ed., *The Fortune Encyclopedia of Economics*, New York: Warner Books, 1993, pp. 39–43.

William J. Baumol, "On Location of Industries Among Trading Countries: Scale Economies as Possible Offset to Comparative Advantage," in Hiroshi Ohta and Jacques-Francois Thisse, eds., *Does Economic Space Matter? Essays in Honour of Melvin L. Greenhut*, New York: St. Martin's Press, pp. 187–206.

William J. Baumol (with Burton G. Malkiel), "Redundant Regulation of Foreign Security Trading and U.S. Exchanges," in Kenneth Lehn and Robert W. Kamphuis, Jr., eds., *Modernizing U.S. Securities Regulations*, Illinois: Irwin, pp. 39–56.

ARTICLES IN REFEREED JOURNALS:

William J. Baumol (with Burton G. Malkiel), "Redundant Regulation of Foreign Security Trading and U.S. Competitiveness," *Journal of Applied Corporate Finance*, Vol. 5, No. 4, Winter 1993, pp. 19–27.

William J. Baumol, "Formal Entrepreneurship Theory in Economics: Existence and Bounds," *Journal of Business Venturing*, Vol. 8, No. 3, May 1993, pp. 197–210.

William J. Baumol, "Health Care, Education and the Cost Disease: A Looming Crisis for Public Choice," *Public Choice*, Vol. 77, 1993, pp. 17–28.

William J. Baumol, "Social Wants and Dismal Science: The Curious Case of the Climbing Costs of Health and Teaching," *Proceedings of the American Philosophical Society*, Vol. 137, No. 4, 1993, pp. 612–637.

REVIEW ARTICLES:

William J. Baumol, Review of Frank R. Lichtenberg, *Corporate Takeovers and Productivity*, in *Eastern Economic Journal*, Vol. 19, No. 1, Winter 1993, pp. 118–119.

OTHER ARTICLES:

William J. Baumol, "Health Reform Can't Cure High Costs," *Viewpoint, The New York Times*, August 8, 1993, p. 13.

William J. Baumol, "Do Health Care Costs Matter?," *The New Republic*, November 22, 1993, pp. 16-18.

William J. Baumol, "Industrial Productivity," contribution to *Collier's Encyclopedia*, 1993 edition, pp. 748-755.

WILLIAM J. BAUMOL

1992 PUBLICATIONS

CHAPTERS IN BOOKS:

William J. Baumol and Janusz A. Ordover, "Antitrust: Source of Dynamic and Static Inefficiencies?," Chapter 4 in Thomas M. Jorde and David J. Teece, *Antitrust, Innovation and Competitiveness*, New York: Oxford University Press, 1992, pp. 82–97.

William J. Baumol, "Über die Ökonomie von morgen," in Horst Hanusch and Horst Claus Recktenwald, eds., *Die Zukunft der ökonomischen Wissenschaft—Ansichten bedeutender Ökonomen* [Economic Science in the Future—Perspectives by Eminent Scholars], Düsseldorf: Verlag Wirtschaft und Finanzen, 1992, pp. 21–27.

William J. Baumol, "Toward a Newer Economics: The Future Lies Ahead!," Chapter 1 in John D. Hey, ed., *The Future of Economics*, Oxford: Blackwell Publishers, 1992, pp. 1–8.

William J. Baumol and Edward N. Wolff, "Feedback Between R&D and Productivity Growth: A Chaos Model," Chapter 17 in Jess Benhabib, ed., *Cycles and Chaos in Economic Equilibrium*, Princeton: Princeton University Press, 1992, pp. 354–373.

William J. Baumol, "Schumpeter, Formal Analysis of Innovation and Pharmaceuticals," in George Teeling Smith, ed., *Innovative Competition in Medicine*, Luton, England: White Crescent Press Limited, 1992, pp. 13–26.

ARTICLES IN REFEREED JOURNALS:

William J. Baumol, "Horizontal Collusion and Innovation," *The Economic Journal*, 102, January 1992, pp. 129–137.

William J. Baumol (with A.J. Rubinstein and H. Baumol), "On the Economics of the Performing Arts in the Soviet Union and the USA: A Comparison of Data," *Journal of Cultural Economics*, Vol. 16, No. 2, December 1992, pp. 1–23.

REVIEW ARTICLES:

William J. Baumol, Review of Martin Feldstein, *The Economics of Art Museums*, Chicago: University of Chicago Press, 1992, in *Journal of Economic Literature*, XXX, No. 2, June 1992, pp. 942–943.

William J. Baumol, "Innovation and Strategic Sabotage as a Feedback Process," *Japan and the World Economy*, 4, 1992, pp. 275–290.

OTHER ARTICLES:

William J. Baumol, "A Growing Economy Can Pay Its Bills," *The Wall Street Journal*, May 19, 1992, p. A14.

William J. Baumol and Ralph E. Gomory, "Scale Economies, Regions of Multiple Trade Equilibria, and the Gains from Acquisition of Industries," C.V. Starr Center for Applied Economics, New York University, RR # 92–10, March 1992.

William J. Baumol, "Time to Plan for Long Run," in Peter Passell, "Making a Case for a Fiscal Jolt," *The New York Times*, July 10, 1992, pp. D1 and D4.

William J. Baumol, "Growth, the Market and Dissemination of Technology," *22nd Geary Lecture, 1991*, Dublin, Ireland: The Economic and Social Research Institute, 1992, 21 pages.

William J. Baumol, "Industrial Productivity," contribution to *Collier's Encyclopedia*, 1993 edition, pages 748–755.

William J. Baumol, "Concentrazione industriale," in *Enciclopedia delle Scienze Sociali*, Rome: Istituto della Enciclopedia Italiana, Fondata da Giovanni Treccani, 1992, pp. 232–239.